

REMARKS

Claims 18, 19, 23, 24, 27, 28 and 30-33 are pending in this application. With this Amendment, claims 18, 23 and 30 are amended and claims 25, 27, 28 and 31 are cancelled.

Rejection Under 35 U.S.C. § 103

Claims 18, 19, 23, 24, 27, 28, 30-33 are rejected under 35 U.S.C. § 103(e) as unpatentable over Kim et al. (U.S. Patent No. 6,335,003, hereinafter “the ‘003 patent”) in view of Munzmay et al. (U.S. Patent No. 5,153,297, hereinafter “the ‘297 patent”).

In the Office Action of May 2, 2007, the Examiner states that the cationic polyurethanes of the present invention, with the exception of terminal cationic ammonium groups, are obvious under the teachings of the ‘003 patent. Applicants respectfully disagree.

Whereas the ‘003 patent relates to high molecular weight polyurethanes comprising chain-extended isocyanate prepolymers (*see* col. 5, lines 40-43), the present invention employs isocyanate prepolymers which are merely capped after little or no chain-extensions; and, consequently are relatively low in molecular weight.

Further support to the molecular weight differences between the prior art and the present invention can be found in the choice of reactants and in the stoichiometry. In the ‘003 patent, col. 5, lines 46-49, difunctional isocyanates are reacted with difunctional amine or alcohol chain extenders (*see also* Table) at a mole ratio of about 1 : 1 or in a range of 0.8 : 1 to 1 : 1 to 1. As is known to those skilled in the art, this ratio is intended to and will, under typical reaction conditions, lead to high molecular weight condensation polymers.

As is well-known, high molecular weight polyurethanes are film formers. The polymers of the ‘003 patent are disclosed as film formers (see col. 7, lines 57-58).

By contrast, the polymers of the present invention were designed to have relatively low molecular weight. In Examples 2 and 3, an isocyanate terminated “prepolymer” is first prepared and then capped with the monofunctional N,N-dimethylethanolamine – very little if any chain extension takes place and the final molecular weight is only about 70,000-100,000. Thus, only about 5 PEG units were combined. Furthermore, the final product disclosed was a water thickening, brittle powder and not a film.

The major difference in molecular weight between the present invention and the ‘003 patent is not accidental. Whereas the prior art seeks to provide a film which can help shape or fix the hair, the present invention seeks a soluble polymer to thicken an aqueous media.

The high molecular weight film forming polymers of the '003 patent would not suggest the present invention as it provides an entirely different set of properties directed toward a completely different end-use.

Claim 18 has been amended to more clearly define the present composition; in particular, the presence of polymer chains terminating in cationic groups at both ends with either protonated primary/secondary amines or quaternized tertiary amines. As is known in the art, the chemical structure of end-groups play an important role in determining the functional properties of a polymer system. This is due, at least in part, to the high degree of freedom of motion of the end-group as compared to the rest of the molecule. The unique associative, thickening properties of the present invention are due at least in part to the combination of relatively low molecular weight, cationic groups terminating both polymer chain ends, hydrophilic internal moieties (PEG); and optionally to the hydrophobic quaternary groups on both ends.

The Munzmay patent fails to bridge the gap between the present invention and the prior art. The Examiner has pointed out that while the '003 patent does not teach the presence of cationic end-groups, Munzmay teaches that polyurethane may contain terminal cationic groups.

Like the '003 patent, Munzmay is directed to high molecular weight polymers which impart special properties to fibers. Furthermore, the amine function is incorporated into a single end-group of monohydroxy polyetherester ends without polyurethane cationic end-group enablement.

The present invention relates to the problem of thickening aqueous solution with amphiphilic polymers. Amphiphilic compounds are known in the art to effect water properties such as melting characteristics and surface energy appropriate to the end uses of the present invention in cosmetics such as gels and creams.

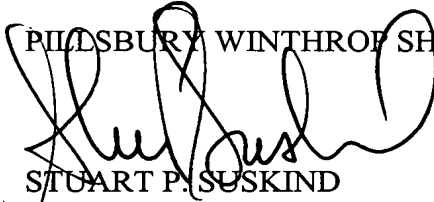
The teachings of the prior art cited, which are directed toward film/coatings strengthen/support substrates would not naturally flow to the present inventors.

CONCLUSION

For the reasons given hereinabove, independent claim 18 and claims 19, 23, 24, 30, 32 and 33, are patentably distinguished from the prior art. Applicants respectfully submit that the application is in condition for allowance and that action is earnestly solicited.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,


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